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ABSTRACT

This report has two major features. First it describes the Pennsylvania Retrieval of Information for Mathematics Education System (PRIMES). PRIMES is an information system in which curriculum materials are computer-stored and are retrieved to meet the specifications of local school districts. As of 1971 there are six regional centers which provide consultative services to the school districts. The report describes briefly the use of PRIMES with regard to test and textbook selection, curriculum analysis, research capabilities, and continuing education. The second feature of the report is survey information relating to personnel, committees, instructional materials, curriculum guides, standardized tests, selection of basal text series, and plans for curriculum changes in Pennsylvania schools during 1970-71. (JBW)

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PRIMES
Pennsylvania Retrieval of Information for Mathematics Education System

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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ELEMENTARY SCHOOL MATHEMATICS—
A STATUS REPORT

by

James T. Welsh
Editorial Staff Writer for
The Washington Evening Star

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Emanuel Berger, Educational Research Associate
Dorothy H. Hoy, Mathematics Education Adviser

Bureau of General and Academic Education
John E. Kosoloski, Director
Doris E. Creswell, Mathematics Education Adviser

Pennsylvania Department of Education
Box 911
Harrisburg, Pa. 17126

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PREFACE

The Elementary School Mathematics—A Status Report summarizes the results of the Pennsylvania Retrieval of Information for Mathematics Education System annual elementary school mathematics curriculum surveys: 1969-70 and 1970-71. The surveys include information relating to personnel and committees, instructional materials, curriculum guides, standardized tests, selection of basal series and plans for curriculum change.

The major intent of these surveys is to provide the Department of Education with a frame of reference for organizing its PRIMES consultative services to assist local school districts in their curriculum development activities. The information included should not be interpreted as an endorsement of any instructional materials or practices. The information has been reported as received from the school districts.

In addition to reporting the survey information, this publication describes the PRIMES project. PRIMES has been established by the Department of Education to assist educators in curriculum development, implementation and evaluation in elementary school mathematics. PRIMES is an information system of curriculum materials that are computer stored and retrieved to meet the specifications of local school districts. Consultative services are available to the school districts in the Commonwealth at the department through regional centers located at IU-7, Greensburg; IU-22, Doylestown; West Chester State College; Lock Haven State College; Millersville State College and Edinboro State College.

INTRODUCTION

Only rarely does progress move with unalloyed speed. Usually, it is slow and deliberate. It comes a step at a time. Or, more likely, it comes with sporadic movement and then consolidation and perhaps an occasional setback.

So it is with the teaching of mathematics in our schools.

More than a decade ago, the word went out: The "new math" is on its way. The implication was clear. It could be assumed that with quite new and better methods of presenting mathematical concepts, school children everywhere were on their way to new dimensions of learning. Progress would be clear and straightforward.

It wasn't all that simple. A decade later, as we move well into the Seventies, it would be fair to say that in many parts of Pennsylvania, in too many of its school districts, the teaching of mathematics remains in the doldrums. Rather than having changed dramatically, it tends to resist change.

This is not to say there has been an absence of progress over the years. Advances have come. The most conspicuous of them is the wholesale changeover of textbooks to reflect the concepts and terminology of modern mathematics. School districts now have a wide choice of improved instructional materials--the kind of visual aids, manipulative devices and reference materials that can be so useful in complementing the textbooks.

Yet texts and instructional materials are only as good as the people who use them--and choose them. In a crack school district, it can be expected that the teachers are on top of what they teach, thoroughly familiar with the new math principles, that these teachers have coordinated what is taught from grade to grade, and that the school district has put together a workable procedure to choose the textbooks and the instructional materials best suited to that district's needs.

On these points, much of Pennsylvania is lagging. Progress indeed has been slow and sporadic. The number of math coordinators and specialists has increased, but hardly in dramatic fashion. The regular elementary school teacher gets along as best he can. Typically, his undergraduate education has included much less than the 12 semester hours of special college mathematics that have been recommended as a minimum for prospective elementary teachers. And, typically, he does not undergo periodic upgrading or refresher work. Whereas a decade ago a big infusion of federal and state funds enabled thousands of teachers to take special courses in the new math, these funds have shrunk in recent years, and so has the number of teachers taking part in continuing education.

The task of selecting an appropriate text is not nearly so easy as it might appear. It's one thing to say that textbooks are better. But they are different, nevertheless, and anyone trying to differentiate among them faces the task of going through more than 40,000 pages of material--the total of all the basic programs put together. True, nearly all school districts work by committee, an advance in itself. But that doesn't solve the problem. The job of making careful distinctions in the content of all the texts is too enormous. And so many school districts wind up making a choice on the basis of secondary criteria, such as the apparent durability of the books.

What's needed, of course, is system, the kind of system-management approach that can help local districts crack through the barrier of decision-making and, in the process, get a better grip of what they are trying to accomplish in elementary school mathematics.

This report, after taking a look at the latest math curriculum survey of Pennsylvania schools, will tell of one such approach--the Pennsylvania Retrieval of Information for Mathematics Education System. It will give a status report on the PRIMES statewide effort to assist local districts to help themselves to what is possible in modern math education practices.

CURRICULUM SURVEYS: 1969-70 — 1970-71

One of PRIMES' responsibilities is to conduct the annual Pennsylvania Elementary School Mathematics Curriculum Survey. Its major purpose is to provide the Pennsylvania Department of Education with a frame of reference for organizing its consultative services.

The first such survey was conducted in the 1967-68 school year. The latest survey was for the 1970-71 year, the fourth one conducted by PRIMES. It represents responses from 548 Pennsylvania school districts, 99 per cent of the state total, and seven more than the number of districts that responded to questionnaires in the 1969-70 survey. This section will present data from both of the last two surveys.

Much of the statistical data has been converted to graphs. Tables summarizing the data are included in the appendixes. In these tables, N refers to the number of administrative units, or school districts, with the percentage based on the number--541 in 1969-70 and 548 in 1970-71--that responded to the questionnaires. Where the figures add to more than those numbers, it means some school districts checked more than one item on a question.

Up Through the Grades

Nearly three-quarters of the school districts in Pennsylvania, 73.4 per cent, report they organize their elementary schools to run from kindergarten through 6th grade. Another 14 per cent of the schools follow the 1-6 plan. The other districts follow such alternatives as K-5, 1-5, K-4 and K-8.

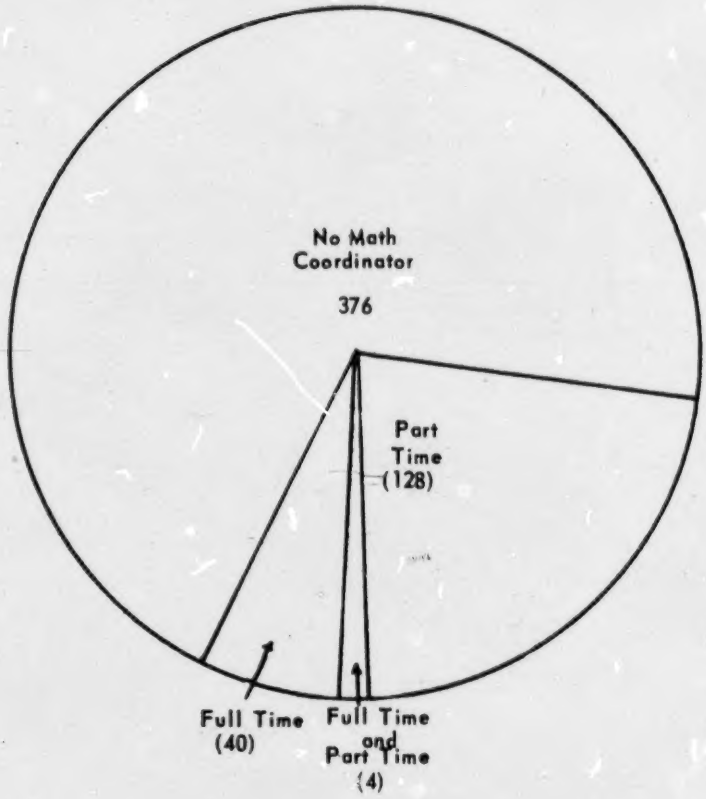
With 6th grade remaining the common dividing line between elementary and secondary school, it comes as no surprise that most school districts operate either a 6-6 (42 per cent) or 6-3-3 (36 per cent) school organization. Another 8 per cent of the districts run a 6-2-2 organization. A total of 24 different organizational structures was reported.

One notable trend in Pennsylvania is the growth of the number of middle schools. These districts responding to the 1969-70 questionnaire reported operating 60 middle schools. This last year that number more than doubled, to 123 middle schools. The most frequently found grade ranges in these schools were 6-8, 5-8, 7-8 and 5-7.

This is a trend with one decided implication for the teaching of mathematics. The specialized math teacher can be very helpful in intermediary grades. Frequently, it is difficult for school districts to provide such specialists in the K-6 or 1-6 elementary organizations with their traditional dependence on self-contained classrooms. The middle school offers more flexibility to include specialized instruction.

Figure 1

Administrati e Units Employing Math Coordinators 1970-71



The Math Coordinator

Any school district trying to upgrade its math curriculum will find that a coordinator can play a key role. The coordinator's major responsibility is the continual upgrading of the curriculum. He or she is in a position to assist teachers, develop in-service programs, investigate new instructional ideas and see that the most promising of these ideas are incorporated into classroom practice.

Pennsylvania has nothing to brag about on this front. The number of part-time math coordinators appears to be going up. The number of full-time coordinators in 1970-71 was down from the year before. The latest survey revealed 81 districts with full and part-time math coordinators at work in all Pennsylvania elementary schools. When both elementary and secondary schools are considered, the total reported was 128. The typical Pennsylvania school district had no one serving in this role.

Classroom Organization

The self-contained classroom remains predominant on the Pennsylvania school scene. A regular teacher runs the elementary class, responsible for all that is taught. But special teachers also are on the scene, especially on the 5th and 6th grade levels. School districts reported 1,547 special math teachers visiting 6th grade classrooms on a regular or occasional basis. They reported 1,305 special teachers in 5th grade.

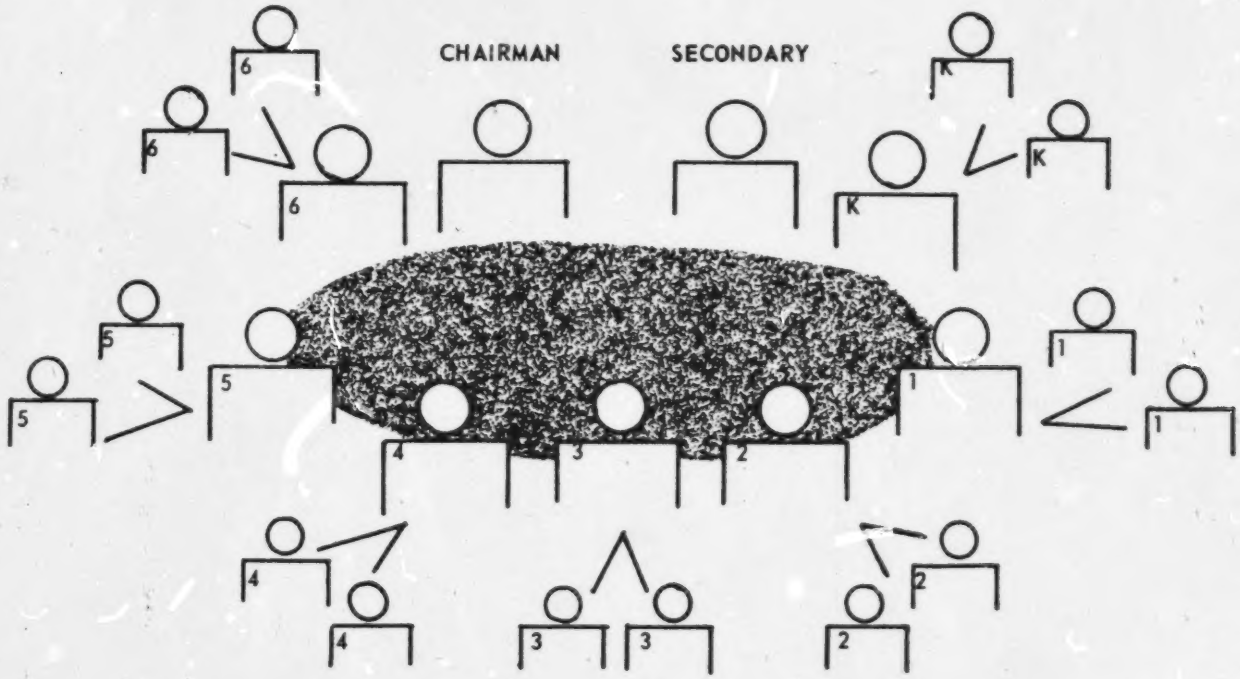
It would be difficult to judge the merits of the frequent arguments over what is best--self-contained class teaching or any of several approaches to specialized teaching in elementary grades. Still, many school districts do see the value of the special teacher, especially in the intermediate grades. Certainly it is one way of getting around the big barriers to wholesale continuing education of the regular teachers. Moreover, the growing number of middle schools most likely will lead to greater use of the specialized-teaching approach.

The Curriculum Guide

It is no exaggeration to say that any school district is doing itself a favor by preparing its own elementary math curriculum guide, rather than depend on the guides put out by textbook publishers. It means that this school district is tailoring the curriculum to its own particular needs. And through the hard work that goes into the page-by-page construction of such a guide, there usually comes an important by-product. The math committee members will gain a greater grasp of the new math and of the ingredients that are essential to a good math curriculum.

Figure II

RECOMMENDED STUDY COMMITTEE ORGANIZATION



CORE COMMITTEE

GRADE LEVEL MEMBERS

There has been little progress in this area. A total of 418 school districts reported relying on the curriculum guides that publishers offer to accompany the texts they put out. The survey showed 127 districts having developed their own guides, with another 88 preparing to do so. The total of 215 districts relying on themselves rather than publishers is lower by 12 than the total the year before and lower by an even greater number than the total a year before that.

The Curriculum Committee

In selecting texts, in putting together a curriculum guide, and in other ways keeping the math curriculum up to date, the curriculum committee is essential. It pulls together the best of what administrators, specialists and regular teachers have to offer.

In the 1970-71 school year, a total of 382 school districts reported active elementary math committees, considerably above the number reported the year before. Moreover, the overwhelming majority of school districts--516, or 95.4 per cent--reported that when it came time to select new textbooks, the task was performed by committee. Only 22 districts said an individual made the selection. This is a bright spot in the Pennsylvania picture, although the qualification should be made that the actual performance of the math committees cannot be gauged, at least by questionnaire, and that this performance certainly must range from excellent to perfunctory.

Teachers of primary and intermediate grades were represented most heavily on the math committees in Pennsylvania schools. The typical committee also included an elementary school principal or supervisor, the curriculum coordinator, where available, and a representative from the secondary grades.

One type of organization PRIMES recommends consists of a core committee and seven grade level committees. Ideally, nine members serve on the core committee: a chairman, representing the administration; a secondary school representative; and the leader, or chairman, of each of the subcommittees. The subcommittee at each grade level, K-6, consists of the leader and two other teachers. It goes without saying that the members are selected for their enthusiasm about the subject and their willingness to work.

Choosing Texts and Tests

By now it can be said that all school districts in the state are using textbooks that represent the new math approach. From information received in the recent past, the conclusion can be reached that the typical school district plans to purchase new math texts about every five years. Probably this pattern--changing to new books, either from the same or a different publisher every five years--reflects economic considerations

as much as anything else, and it is difficult to argue with that. Even so, it can be added that when the time does come for a district to get new books, every effort should be made to select the best possible texts.

Much the same can be said about choosing standardized tests, which are an essential tool of evaluation. School districts are free to select from a considerable number of tests, and an effort should be made to dovetail the tests with a district's instructional program.

What PRIMES offers is both a systematic analysis of available textbooks and a similar analysis of the various available standardized tests.

Continuing Education of Teachers

Here is another area of critical importance, one in which the surveyed evidence of what's happening can hardly be called encouraging.

From the mid-Sixties to the last years of the decade there was considerable erosion in in-service math training of elementary teachers in Pennsylvania. At this point less than a third of the state's school districts run in-service programs in math. And though the number of participating teachers may remain the same, or perhaps be on the increase, it appears that on the whole they are spending less time in continuing education.

The 1970-71 survey showed that 192 districts ran some kind of math in-service program. More than half of these districts reported their programs consisted of two to five sessions a year, each of the sessions normally running an hour or two in the form of a workshop seminar. Only 11 districts reported in-service programs of more than 10 sessions a year. The programs in three of these districts consisted of more than 20 sessions.

Research Capability

The great majority of school districts have indicated in the past their willingness to participate in research and innovation in the teaching of math. This is a healthy sign. Nevertheless, only a small fraction of school districts now engage in significant research. One reason for this, of course, is limited financial ability and limited research capability.

On the latter point, the PRIMES survey asked school administrators to indicate the availability of computers to their districts. The latest survey showed that, on their own or through arrangements with county office, colleges or industry, 106 districts could gain access to computers. This total was 11 higher than the 1969-71 reported figure.

PRIMES: A SYSTEMS APPROACH

The PRIMES operation helps school districts do what they would find difficult or impossible to do for themselves. In the composition of a math curriculum and in the choice of instructional materials that suit the curriculum a school district decides is best, PRIMES does this through the powerful new tool of computer technology.

At the heart of PRIMES is a computerized, page-by-page analysis of the math content and skill-achievement objectives to be found in every available elementary math textbook. Some 400 math concepts appropriate to elementary math education are indexed. So are 3,000 different skill objectives. All of this information is instantly accessible by computers. A school district might want to know which texts introduce a particular concept in the beginning of the fifth grade. The answer is available within seconds.

This kind of technology would be highly difficult for local schoolmen to use without assistance. And it would be difficult to decentralize. And so, in seeking ways to maximize the system's value to local schoolmen, PRIMES officials decided early to keep the information-retrieval technology centralized in Harrisburg while working on a day-to-day consulting basis with local districts from offices located throughout the state.

When a school district decides to work through the PRIMES approach, it follows a well-defined series of steps. First comes the formation of the kind of math curriculum committee PRIMES recommends. The committee conducts a math content analysis of the texts it is presently using. After that, first through the grade level subcommittees and then through the core group, the committee undertakes the considerable task of compiling a master list of math content items it considers important, signifying for each of these items at what grade it should be introduced and when it should be mastered. Each of these items bears a code number for use by the computer. When the master list is completed, the PRIMES computer can go to work. Within days the computer analysis is back in the hands of the local math committee. It includes printouts showing which texts "hit" particular content items at the point the committee wants them taught. And by constructing a chart showing the number of "hits" per text, the committee then finds it relatively simple to winnow down the number of textbook offerings and then to make the choice of one text to serve its elementary grades or perhaps two or three texts to serve different grades. Further analysis by the PRIMES computer then enables the committee to construct its own curriculum guide and, beyond that, to select appropriate tests and instructional materials.

An optimistic sign in Pennsylvania math education is that an increasing number of school districts recognize the importance of the systems approach. Two years ago, just getting off the ground, PRIMES was

w[illegible] with about 25 school districts, 10 to 15 of them on an intensive basis. At this point PRIMES is in contact with approximately 70 districts. It is working intensively with 42 of these districts. Apparently the work of the PRIMES project is spreading for in recent months a number of local school administrators have requested that their districts take part in the program. The big Philadelphia and Pittsburgh school districts, while not following every stage of the program, nevertheless are now using the PRIMES information retrieval system to conduct their own curriculum and textbook analysis.

The PRIMES operation is expanding its own capability. Up to now it has provided consultant services through four centers, in Westmoreland County, at West Chester State College, in Bucks County, and at central headquarters in Harrisburg. Three more are about to open shop, at Edinboro, Millersville and Lock Haven State Colleges. Together with the existing centers, they will have the capability of working with 200 school districts. This is a further step along the way towards PRIMES' eventual goal: the capability of bringing its systems approach within reach of every Pennsylvania school district.

The 1970-71 math curriculum survey reveals that many Pennsylvania school districts have a long way to go if they are ever to claim a modern, well thought-out math curriculum, the kind of curriculum and teaching practice that every child deserves and should have. PRIMES has demonstrated it can provide the help necessary for a school district to build a better product. At this time, on its ways to going statewide, PRIMES stands ready to assist those school districts that want assistance. It welcomes inquiries. And it welcomes suggestions for making its own product more effective.

APPENDIX A

SCHOOL DISTRICTS USING PRIMES FOR CURRICULUM PRODUCTS

Regional Center G — Greensburg

Armstrong County
- Armstrong
- Freeport Area
- Leechburg

Indiana County
- Homer Center
- Indiana Area
- Marion Center
- Purchase Line
- United

Westmoreland County
- Belle Vernon Area
- Burrell
- Derry Area
- Franklin Regional
- Greater Latrobe
- Greensburg-Pittsburgh Diocese
- Greensburg Salem
- Jeannette
- Kiski
- Ligonier Valley
- Monessen
- Mount Pleasant Area
- New Kensington-Arnold
- Norwin
- Southmoreland
- Yough

Bucks County
- Bensalem Township
- Bristol Township
- Council Rock
- Neshaminy
- Pennsburg
- Pennridge

Department of Education

Allegheny County
Pittsburgh

Cumberland County
Mechanicsburg Area

Dauphin County
Derry Township

Franklin County
Waynesboro Area

Huntingdon County
Juniata Valley

Lancaster County
Eastern Lancaster County

Philadelphia County
Philadelphia City

Washington County
California Area

Regional Center P/R — West Chester State College

Chester County
Great Valley
Owen J. Roberts
Tredyffrin-Easttown

Delaware County
Ridley

Montgomery County
Lower Moreland

03-70-1

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DEPARTMENT OF EDUCATION

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PRIMES CURRICULUM SURVEY

This questionnaire is an integral part of the Pennsylvania Retrieval of Information for Mathematics Education System Curriculum Survey. All of the information requested is related to the mathematics program in the elementary school. The completed form should be returned by November 1, 1970 to:

First and Second Class Districts . . . PRIMES, Department of Education Box 911, Harrisburg, Pa. 17126

Other Districts . . . . County Office

1. School District_____ Intermediate Unit No._____

   Address_____ (zip code)

   County_____ Phone ( )_____

2. Circle school system organization:

   6-6 8-4 6-2-2-2 4-4-4 6-3-3 5-3-4 Other _____

3. Circle range of grades in your elementary school program:

   K K-1 K-2 K-3 K-4 K-5 K-6 K-7 K-8

   1 1-2 1-3 1-4 1-5 1-6 1-7 1-8 Other _____

4. Circle range of grades of middle school: 5-7 5-8 6-8 7-8 Other _____

5. Number of full-time elementary teachers_____ part-time_____

6. Number of teacher aides used in mathematics instruction_____

7. Number of elementary buildings _____

8. Indicate person responsible for elementary mathematics curriculum:

   Name_____ Phone ( )_____

   Title_____

   Responsibility: K(1)-12____ K(1)-6____ Other (specify)_____

   Approximate per cent of time devoted to elementary mathematics _____%

9. Indicate the number of mathematics coordinators in school district:

Full-time: K(1)-6 _____ K(1)-12 _____

Part-time: K(1)-6 _____ K(1)-12 _____

10. Indicate the number of classes that are organized for mathematics instruction by:

WRITE A NUMBER — NO CHECKS

	K	1	2	3	4	5	6	7	8
Self-contained classrooms									
Departmentalized classrooms									
Other: (specify)									

11. Check the type of curriculum guide used:

	Yes	No	Year Adopted
Guide published for textbook	____	____	_____
Developed by staff (please enclose copy)	____	____	_____
Guide in preparation	____	Completion date	_____
No guide _____			
Other (describe) _____			

12a. Indicate the number of the following positions represented on your elementary mathematics committee:

WRITE A NUMBER — NO CHECKS

High school principals	____	K-3 teachers	____
Elementary principals	____	4-6 teachers	____
Curriculum coordinator	____	7-9 teachers	____
Math coordinator	____	10-12 teachers	____
Elementary supervisors	____	Department chairman	____

Others: (describe)_____

12b. If there is no elementary mathematics committee check here ( ).

13. Is a computer available to your school system? Yes____ No____

Location_____ Mfr._____ Model No._____

14. Use the enclosed list of textbook codes and copy the code number in the first column. Check grades using book. Indicate year of adoption.

A. Basal Text:

Code	K	1	2	3	4	5	6	7	8
Adopted									
Adopted									
Adopted									

B. Supplementary Text:

Code	K	1	2	3	4	5	6	7	8
Adopted									
Adopted									

15. Indicate the year for which your next textbook adoption is planned. If adoption date is undecided check here ( ).

	K	1	2	3	4	5	6	7	8
Year									

16. Indicate in-service mathematics programs for school year 1970-71:

No. of Participants	No. of Sessions	Min./hrs. per Session	Mode of Instruction (ETV, Workshop, CAI, etc.)

17a. For published achievement tests indicate number of classes for each grade and copyright of edition administered. Include information for grade 7, required for Educational Quality Assessment.

NUMBER OF CLASSES — NO CHECKS

Test	Publisher	Copyright	K	1	2	3	4	5	6	7	8	Month Given
Calif. Ach. Test	CTB											
Comp. Test of Basic Skills	CTB											
Iowa Test of Basic Skills	HM											
Metro. Ach. Test	HBW											
Sequent. Test of Educ. Prog.	ETS											
SRA Ach. Series Mod. Math	SRA											
Stanford Ach. Test	HBW											
Wisconsin Contemp. Test of Elem. Math	Ginn											
Iowa Modern Math Supplement	HM											
Others:												

17b. If no test is used check here ( ).

17c. Is a commercial test scoring service used?

Yes_____ No_____ Specify_____

17d. Number of weeks for return of scores_____.

17e. Where are scores filed? _____

18a. Describe research or other activities related to mathematics during 1970-71:

_____

_____

(Please enclose a report)

18b. Planned during 1971-2: _____

_____

_____ _____

Signed Title

Date_____ Phone ( )_____

APPENDIX C

SCHOOL DISTRICTS REPORTING INNOVATIVE RESEARCH AND ACTIVITIES
1970-71

Individually Prescribed Instruction (IPI)	County
Baldwin-Whitehall	Allegheny
Bellevue Borough	Allegheny
Camp Hill	Cumberland
Greater Johnstown	Cambria
Keystone Central	Clinton
Quakertown Community	Bucks
Reading	Berks
Wilkes-Barre City	Luzerne

Computer-Assisted Instruction (CAI)	
Eastern York	York

Non-graded mathematics, Continuous Progress, Cross grouping and other organizational structures	
Big Spring	Cumberland
Camp Hill	Cumberland
Chichester	Delaware
Ligonier Valley	Westmoreland
Philadelphia	Philadelphia
Rockwood Area	Somerset
Shippensburg Area	Cumberland
West Mifflin Area	Allegheny
Westmont Hilltop	Cambria

Individualized Approach to Mathematics	
Bethel Park	Allegheny
Lake Lehman	Luzerne
Milton Area	Northumberland
Octorara Area	Chester
Pittston Area	Luzerne
Randolph-East Mead	Crawford
Upper St.Clair	Allegheny
Williamsport Area	Lycoming

Systems Approach to Mathematics (SAM)	
Pittsburgh	Allegheny

Primary Education Project (PEP)	County
Keystone Central	Clinton
Pittsburgh	Allegheny
Planned Learning According to Needs (PLAN)	
Bethel Park	Allegheny
Pittsburgh	Allegheny
Remedial and Enrichment Programs	
Brownsville Area	Fayette
Fort Cherry	Washington
Spring-Ford Area	Montgomery
Valley View	Lackawanna
Computer Programming	
Rose Tree Media	Delaware
Mathematics Laboratories, Academic Games and Specialized Instructional Materials	
Avonworth	Allegheny
Bethel Park	Allegheny
Cheltenham Township	Montgomery
Millcreek Township	Erie
Pittston Area	Luzerne
Rose Tree Media	Delaware
South Park	Allegheny
Springfield Township	Montgomery
Stroudsburg Area	Monroe
Upper Perkiomen	Montgomery
West Mifflin Area	Allegheny
Wilkes-Barre City	Luzerne
Research Activities	
Bangor Area	Northampton
Council Rock	Bucks
Erie City	Erie
Penns Manor Area	Indiana
Pennsbury	Bucks
Philadelphia	Philadelphia
Radnor Township	Delaware
Rockwood Area	Somerset
Rose Tree Media	Delaware
South Middleton	Cumberland

TABLE I.

APPENDIX D

MATHEMATICS COORDINATORS

1970-71

	Districts	Coordinators
Part-time K(1)-6	62	77
Full-time K(1)-6	19	25
Part-time K(1)-12	97	121
Full-time K(1)-12	31	34

172 districts reported coordinators

4 districts reported both part-time and full-time coordinators

34 districts reported coordinators for K(1)-6 and also for K(1)-12

TABLE II.

MATHEMATICS COMMITTEE ORGANIZATION

	Members 1969-70	Members 1970-71
High school principal	40	83
Elementary principal	434	517
Curriculum coordinator	99	113
Math coordinator	65	78
Elementary supervisor	189	168
K-3 teachers	1596	2197
4-6 teachers	1415	1848
7-9 teachers	203	262
10-12 teachers	118	165
Department chairman	113	161
Others	67	86

1969-70: No active committee in 263 administrative units

1970-71: No active committee in 152 administrative units

TABLE III.

IN-SERVICE MATHEMATICS PROGRAMS
1970-71

Participants	School Districts	Mode of Instruction	School Districts
Less than 10	36	No answer	1
10-25	51	ETV	5
25-50	55	Workshop seminar	185
50-100	39	Lecture	4
100-150	6	Films	1
150-200	4	Course	1
200-250	1	Computer Assisted Instruction	3
		Meeting	9
		Insufficient information	14

Sessions	School Districts	Time per Session	School Districts
1	60	Less 1 hr	26
2-5	114	1 hr.	73
5-10	26	2 hr.	84
10-15	3	3 hr.	19
15-20	5	4 hr.	5
More than 20	3	More than 4 hr.	19

TABLE IV.

STANDARDIZED TESTS

NUMBER OF CLASSES

1970-71

	K	1	2	3	4	5	6	7*	8*
California Achievement Tests	3	11	16	33	27	21	36	10	7
Comprehensive Tests of Basic Skills	0	0	2	4	6	5	5	1	0
Iowa Test of Basic Skills				119	122	149	113	45	19
Metropolitan Achievement Tests	116	127	77	66	59	59	16	8	
Sequential Tests of Educational Progress					4	5	8	3	4
SRA Achievement Series	4	7	10	13	16	19	22	6	6
Stanford Achievement Test	18	148	199	190	204	193	209	69	47
Wisconsin Contemporary Tests				1	1	1	2		
Iowa Modern Mathematics Supplement				8	12	11	12	5	4
Others	5	8	10	21	16	20	23	13	11

*Middle schools

TABLE V.

TEXTBOOK SERIES IN USE - BASIC
1970-71

Code*	K	1	2	3	4	5	6	7**	8**
00	39	57	56	47	48	48	49	8	7
01	11	17	17	27	32	30	29	5	6
04	1	7	8	4	7	8	6	2	2
05	4	17	20	31	32	31	32	10	8
08	1	1	1	2	6	9	8	4	4
12	1	4	4	4	4	4	4	0	0
16	3	4	4	4	4	4	5	2	2
18	0	1	1	1	1	1	1	0	0
19	0	1	1	1	1	1	1	1	1
20	25	35	35	42	42	43	40	3	3
21	14	28	28	24	28	25	22	1	1
24	0	4	4	4	3	3	3	0	0
29	0	0	0	0	0	0	0	1	1
32	4	12	12	19	18	20	20	1	1
36	8	11	12	15	13	16	16	4	3
38	4	11	11	13	12	10	8	3	3
39	2	26	26	14	18	16	15	3	3
40	16	35	35	58	60	59	60	10	8
41	22	37	37	28	28	29	24	13	11
44	1	0	0	0	0	0	0	0	0
45	1	1	0	0	0	0	0	0	0
49	5	4	4	2	2	2	2	0	0

*See Appendix D-9-11
**Middle schools

(con't)

TABLE V.

TEXTBOOK SERIES IN USE - BASIC
1970-71

Code	K	1	2	3	4	5	6	7	8
52	29	26	27	24	12	10	9	0	0
53	21	24	23	22	21	19	16	0	0
54	6	4	4	2	2	2	3	0	0
56	1	8	8	10	10	11	12	2	2
60	13	32	35	79	88	90	81	16	15
61	18	39	41	30	28	31	3	5	4
62	40	73	67	35	37	31	3	4	5
65	3	6	6	5	5	5	4	0	0
68	1	1	1	1	2	2	3	1	1
72	36	46	45	35	34	34	32	16	16
78	1	2	3	1	1	1	1		
88	1	0	1		1	1	1		
90	1	1	1	1	3	3	2	1	1
91	3	1	1	1	1	2	2	1	1
92	8	1	1	1	1	1	1	2	1
93									1
96	1	1	1	1	1	1	1	0	0

TABLE VI. TEXTBOOK SERIES IN USE - SUPPLEMENTARY

1970-71

Code *	K	1	2	3	4	5	6	7**	8**
00	0	1	1	2	1	3	3	0	0
01	1	0	0	0	2	3	4	2	2
02	0	0	0	0	0	0	0	1	1
04	1	2	2	3	3	4	2	0	0
05	4	7	7	11	15	14	13	2	2
08	0	5	5	3	4	6	7	0	0
12	1	4	4	4	4	5	4	0	0
16	1	4	4	4	5	6	6	0	0
17	0	1	1	0	0	0	0	0	0
18	0	0	0	0	1	2	2	0	0
19	0	0	0	1	2	3	4	0	0
20	1	2	2	2	3	7	7	0	0
21	2	6	5	3	2	3	4	2	2
24	0	2	2	2	1	1	1	0	0
29	1								
32	3	6	6	6	6	7	7	1	1
36	1	2	3	3	4	4	4	0	0
38	0	2	2	2	2	3	3	0	0
39		5	4	4	4	4	4	0	0
40	0	4	4	6	4	5	4	1	1
41	0	2	1	3	3	4	5	1	0
44	1	1	2	2	3	3	4	1	0
45	1	3	3	2	2	2	2	0	0
49	0	0	0	1	1	1	0	0	0
52	1	3	1	0	1	2	2	1	1
54	0	1	1	1	4	4	4	0	0

*See Appendix D-9-11
**Middle schools

(con't)

TABLE VI.

TEXTBOOK SERIES IN USE—SUPPLEMENTARY

1970-71

Code	K	1	2	3	4	5	6	7	8
56	1	1	1	1	2	2	2	0	0
60	8	9	9	11	12	13	11	2	1
61	0	0	0	1	1	1	1	1	1
62	0	3	3	2	1	0	0	0	0
64	0	0	1	1	1	1	1	0	0
65	0	0	0	1	3	2	2	1	1
68	0	0	0	1	2	3	2	0	0
72	2	0	1	2	3	3	3	1	1
88	0	0	0	0	1	2	2	0	0
90							1		
91	5	6	7	8	4	4	5		
92	1	1							1
93	0	1	1	1	1	1	1	0	0
96	2	1	1	2	2	2	2	0	0

TEXTBOOK SERIES—CODES 1970-71

Code	Publisher	Title	Copyright
00	Addison-Wesley Co., Inc.	Elementary School Mathematics	1968
01	Addison-Wesley Co., Inc.	Elementary School Mathematics	1963, 64
02	Addison-Wesley Co., Inc.	Modern School Mathematics	1967
04	American Book Company	Modern Mathematics Series	1968
05	American Book Company	Modern Mathematics Series	1963, 66
08	American Book Company	Mathematics in Action	1969
12	Encyclopaedia Britannica Press	Math Workshop	1964, 67
16	Ginn and Company	Mathematics We Need	1965, 66
17	Ginn and Company	Elementary Mathematics, 1, 2	1968
18	Ginn and Company	New Mathematics (Write-in Text) 3, 6	1964, 67
19	Ginn and Company	Essential Modern Mathematics	1970
20	Harcourt Brace Jovanovich, Inc.	Elementary Mathematics	1966
21	Harcourt Brace Jovanovich, Inc.	Elementary Mathematics	1968
24	Harper and Row	New Dimensions in Mathematics	1970
28	D. C. Heath and Company	New Ways in Numbers	1964, 65
29	D. C. Heath and Company	New Ways in Numbers	1969
32	Holt, Rinehart and Winston, Inc.	Moving Ahead in Arithmetic	1963
36	Holt, Rinehart and Winston, Inc.	Elementary Mathematics	1966

38	Holt, Rinehart and Winston,Inc.	Elementary Mathematics	1968
39	Holt, Rinehart and Winston, Inc.	Exploring Elementary Mathematics	1970
40	Laidlaw Brothers	Arithmetic	1963, 65
41	Laidlaw Brothers	Mathematics	1968
44	McCormick, Mathers Pub. Co.	Grouping with Arithmetic (The New Arithmetic)	1964
45	McCormick, Mathers Pub. Co.	The New Mathematics	1968
48	Charles E. Merrill	Discovering Mathematics	1964, 66
49	Charles E. Merrill	Discovering Mathematics	1967, 68
52	Science Research Associates	Greater Cleveland Mathematics Program	1968
53	Science Research Associates	Greater Cleveland Mathematics Program	1961, 65
54	Science Research Associates	Elementary Mathematics Program	1968
56	Scott, Foresman and Company	Seeing Through Arithmetic	1963, 68
60	Silver-Burdett Company	Modern Mathematics Through Discovery	1964, 66
61	Silver-Burdett Company	Modern Mathematics Through Discovery	1968
62	Silver-Burdett Company	Modern Mathematics Through Discovery	1970
64	Random House Singer	Sets and Numbers	1962, 66
65	Random House Singer	Sets and Numbers	1968, 69
68	SMSG (Yale University Press)	Elementary School Mathematics	1962, 64
72	Houghton Mifflin Company	Modern School Mathematics	1967
76	McGraw-Hill (Webster Div.)	Elementary Mathematics (Concepts, Properties and Operations	1967

78	Macmillan Company	Developing Mathematics	1970
80	William H. Sadlier, Inc.	Contemporary Mathematics	1965, 68
88	William H. Sadlier, Inc.	Mastering Mathematics	1969
90	Appleton Century Croft	Individualized Prescribed Instruction	1967, 68
91	Continental Press	Modern Mathematics	1966
92	Prentice-Hall	Arithmetic	1963
93	Others		
96	Incomplete data		

TABLE VII.

Middle Schools

RANGE OF GRADES

	Number of districts	
	1969-70	1970-71
6-8	35	44
5-8	9	19
7-8	8	33
5-7	0	3
Others	8	24

1969-70: 541 returns reported 60 middle schools

1970-71: 548 returns reported 123 middle schools

TABLE VIII.

AVAILABILITY OF COMPUTERS
1970-71

	N	%
School district	43	8
County office	4	1
State colleges/universities	25	5
Industry	4	1
Vo-tech	30	6

106 administrative units have computers available.